
06Apr06

KMS

Run 122 Charge Thermometry

- It was realized that the binning resolution of spectra ordinarily acquired by the DAQ or SR770 was too coarse to be able to resolve the continuum below 4 kHz. This is especially true as there is more low-frequency noise in Runs 121 and 122 vs. Run 119. Shortly before warm-up of Run 122, low-span spectra were taken of select detectors.

- It is necessary in this situation to acquire data with multiple spans in order to a clean measurement.
The 0-25 kHz span allows a measurement of the FET-noise plateau.
The 0-3.2 kHz span allows enough resolution to distinguish 60 Hz harmonics from the continuum.

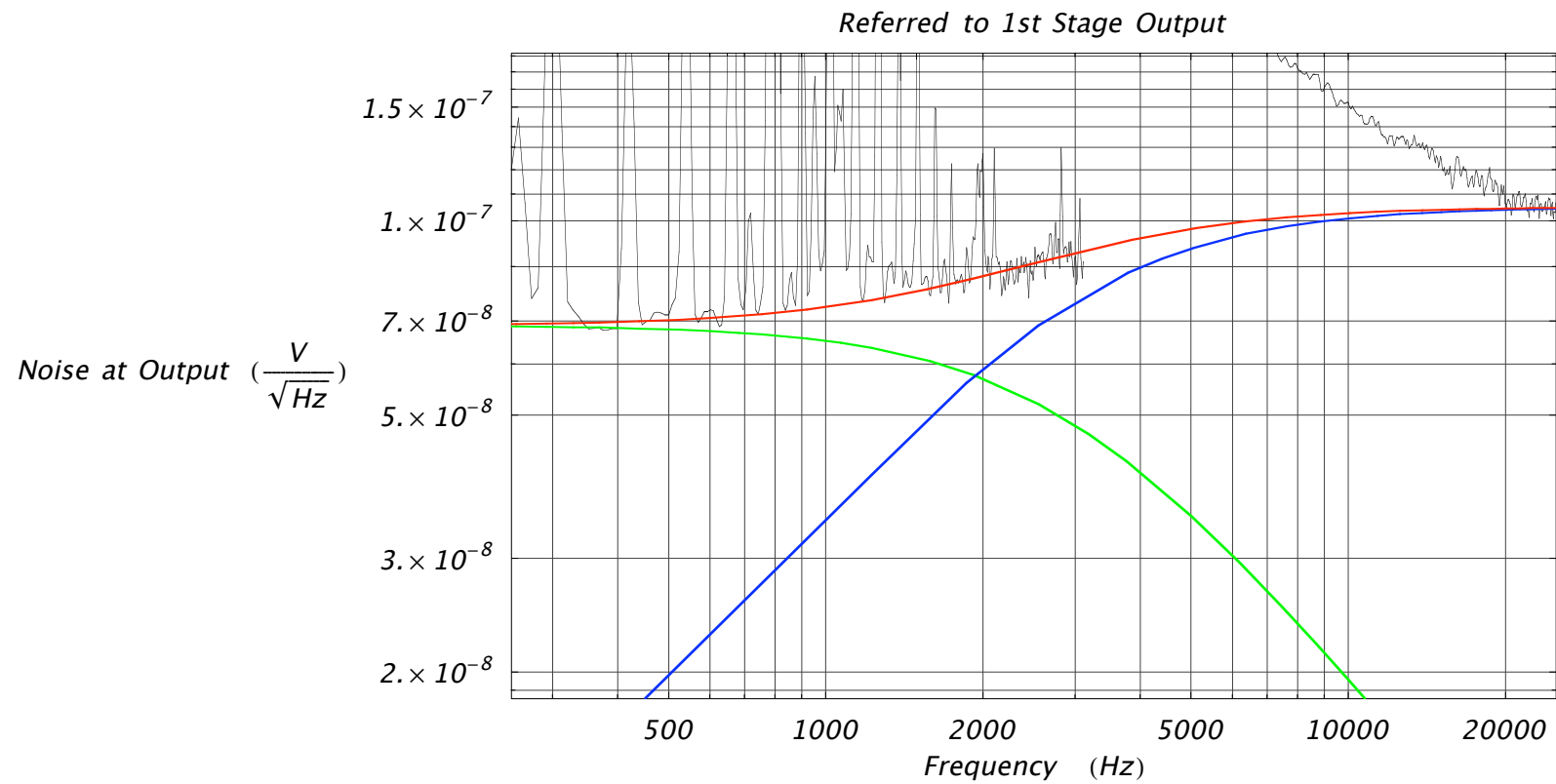
- Below are plots of data taken from the *Qinner* channel of seven detectors. Overlain are curve-fits to select points along continuum.

The green trace shows the (temperature-dependent) current noise on the detector. For a temperature upper limit, all of this noise is assumed to be due to Johnson noise of the 40Meg bias and feedback resistors.

The blue trace shows the contribution of voltage noise, most of which happens to come from the JFET.

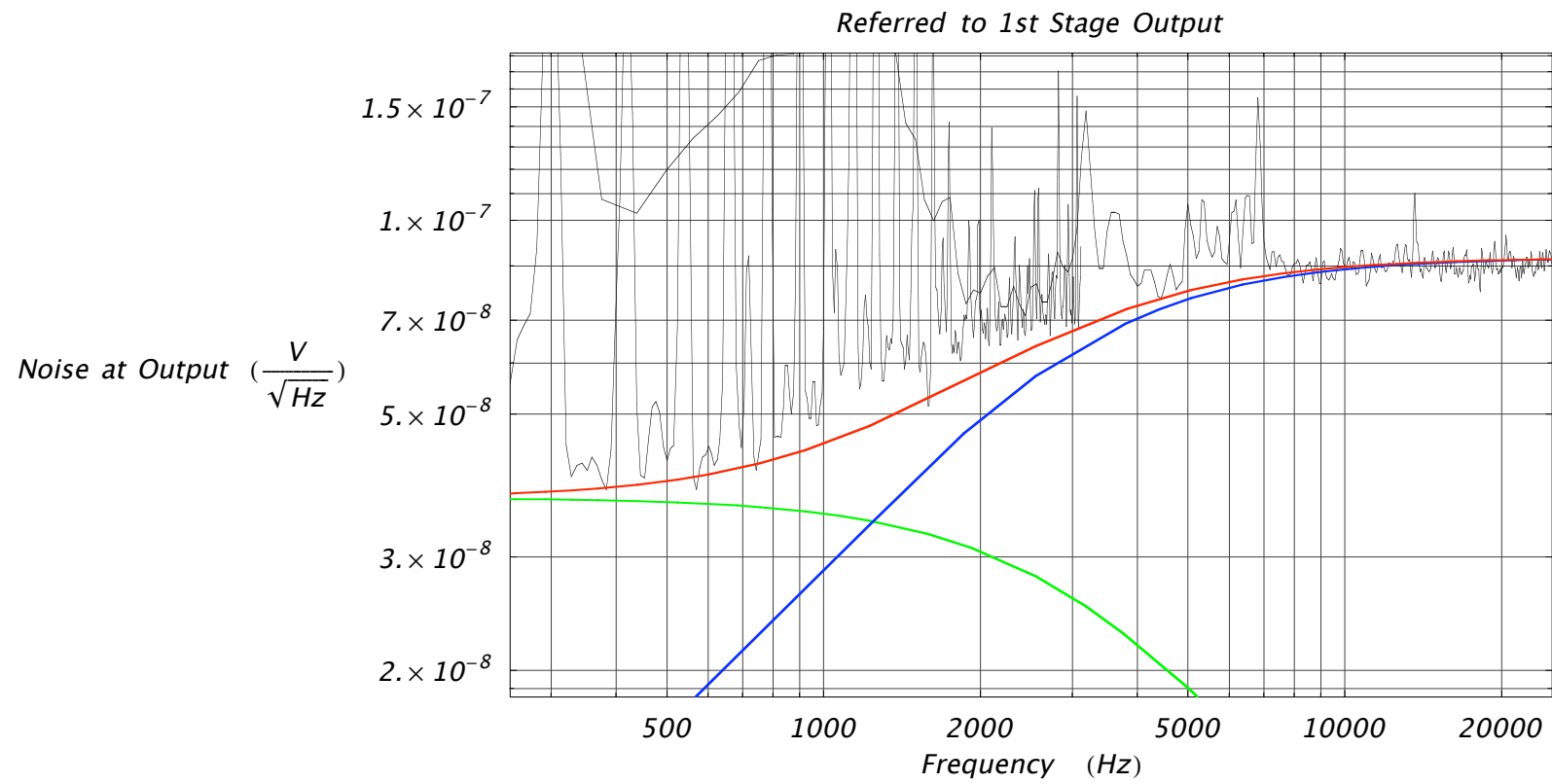
The red trace is the overall noise, which is the quadrature combination of the current and voltage noise sources.

■ T1Z1

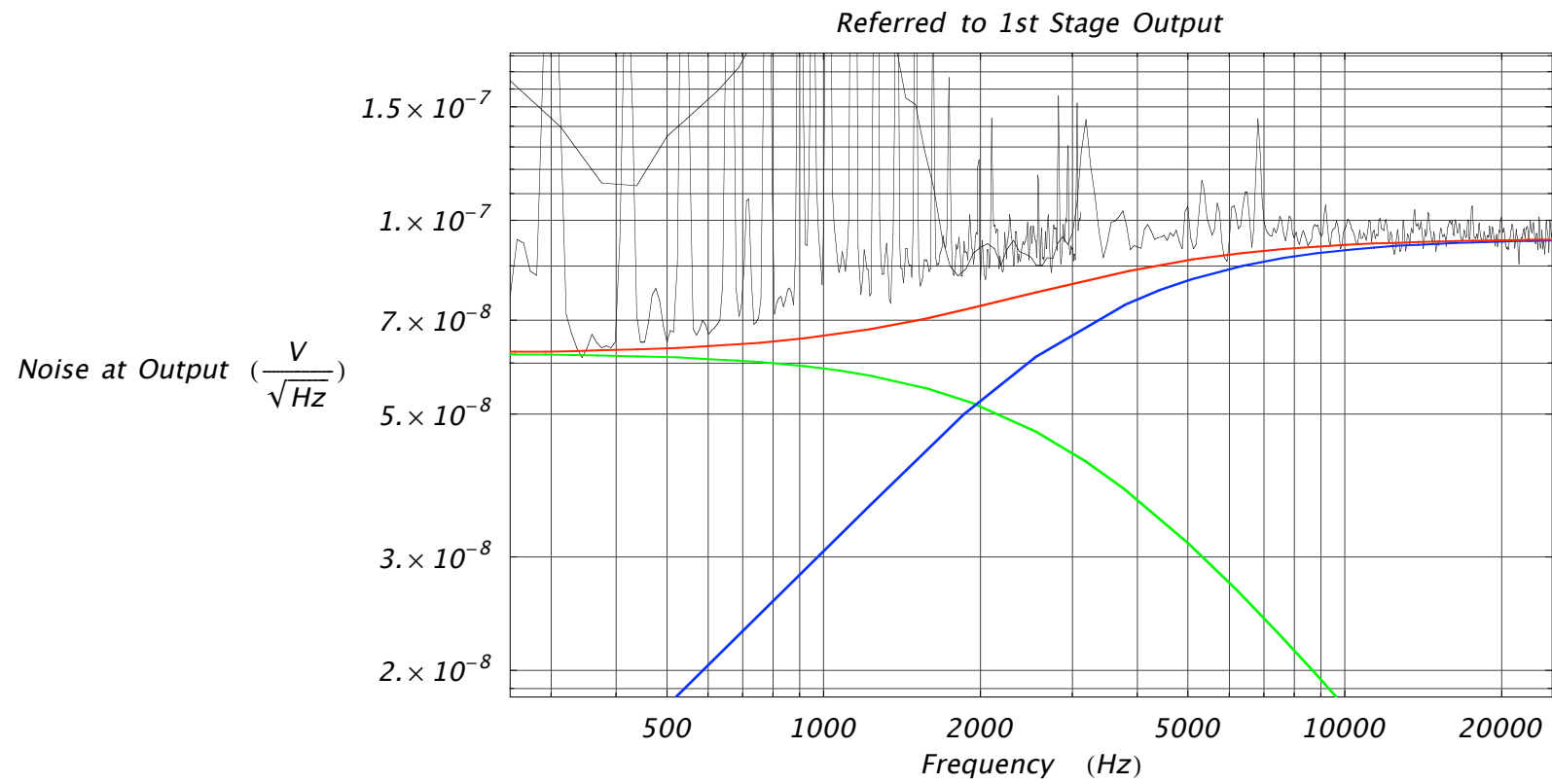
Temperature Upper Limit : 1.072 Kelvin

■ T1Z2

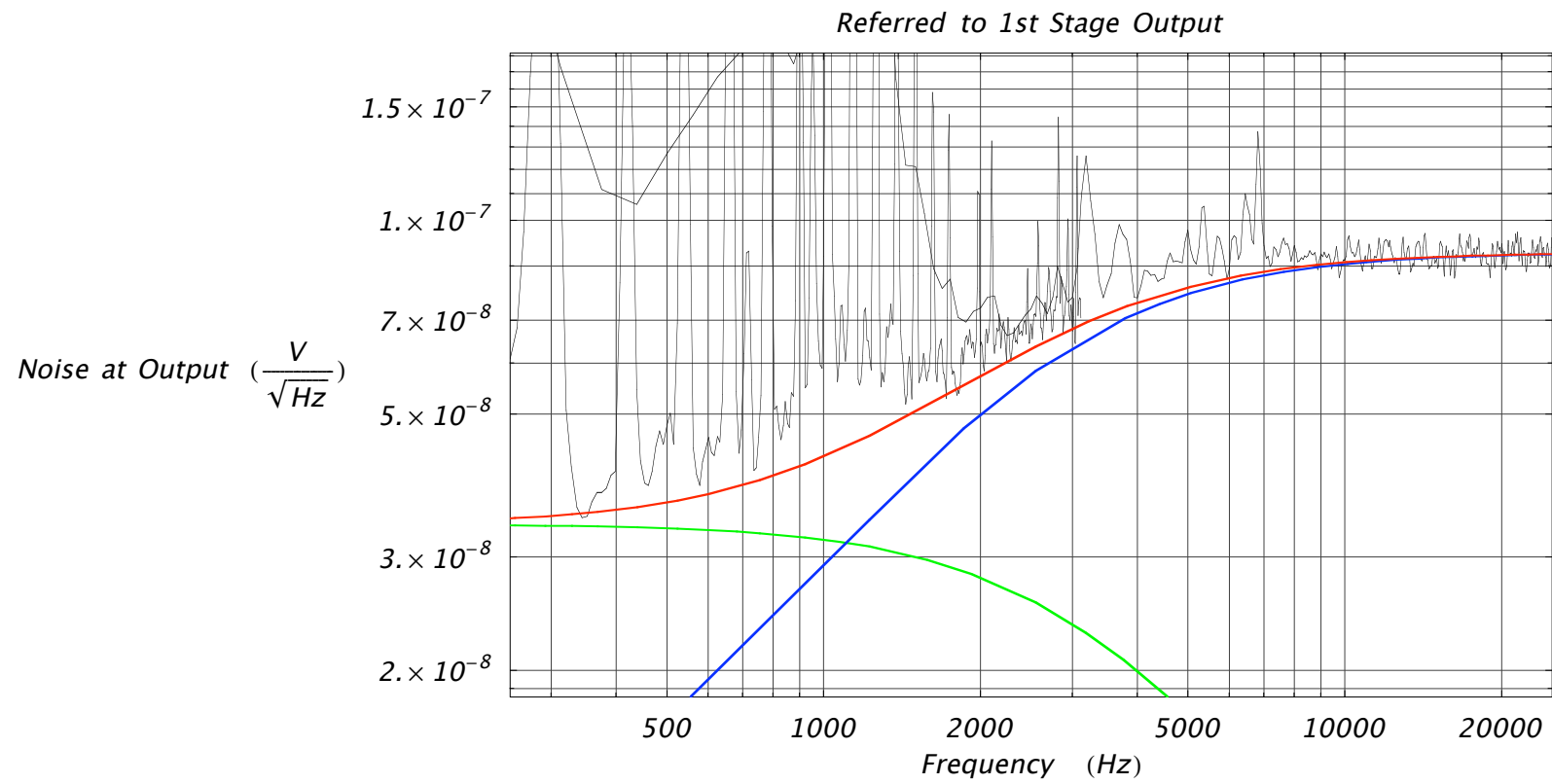
Temperature Upper Limit : 0.311 Kelvin



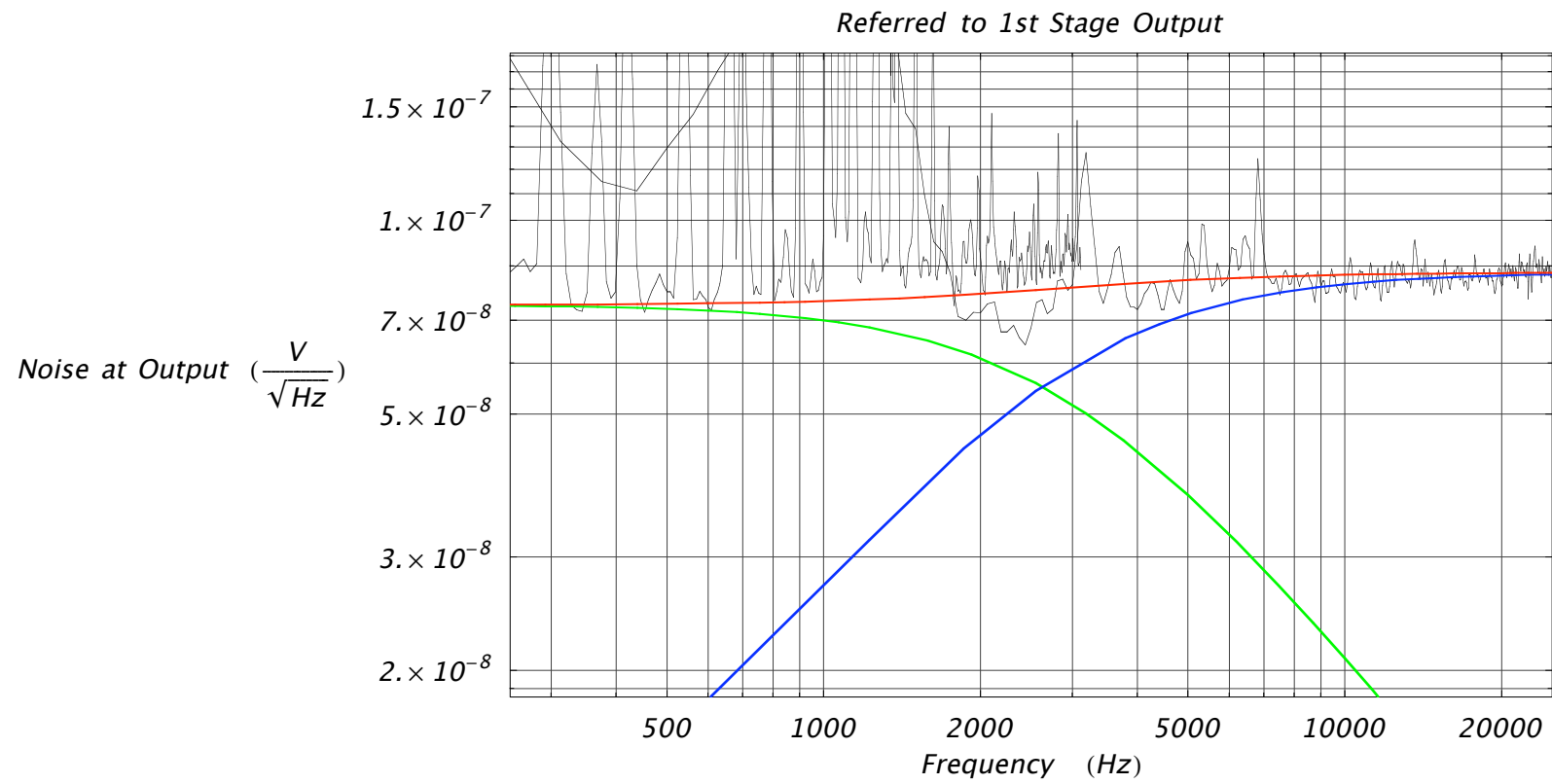
■ T1Z3

Temperature Upper Limit : 0.874 Kelvin

■ T1Z4

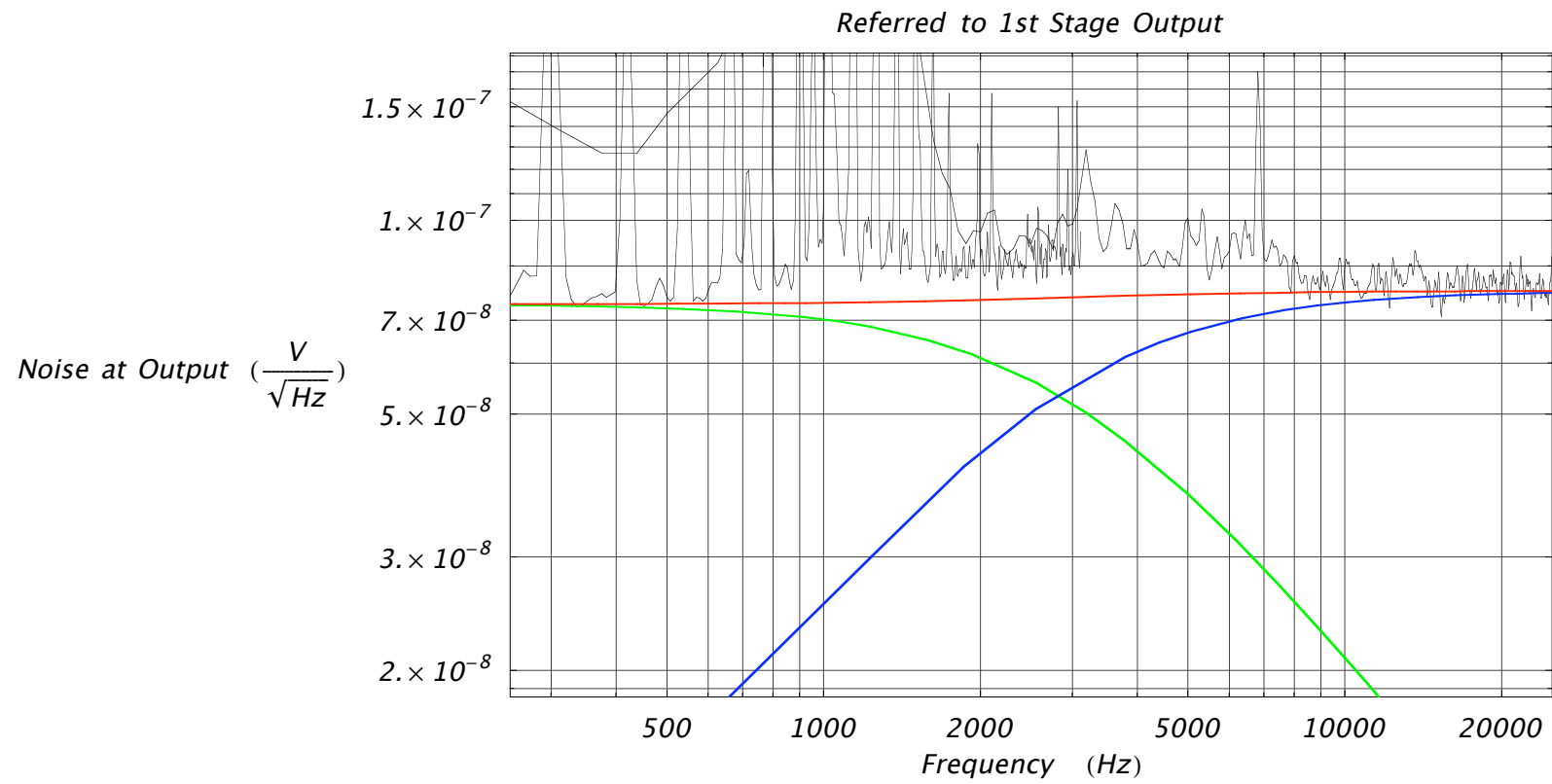
Temperature Upper Limit : 0.256 Kelvin

■ T1Z5

Temperature Upper Limit : 1.234 Kelvin

■ T2Z2

Temperature Upper Limit : 1.240 Kelvin



■ T2Z5

Temperature Upper Limit : 0.398 Kelvin

